CLAIMS

Sub A1

1. A method for characterizing the topology of one or more hydrodynamic bearing surfaces, comprising;

rotating the one or more hydrodynamic bearings;

measuring the surface of the one or more hydrodynamic bearings;

determining at least one reference plane; and

establishing at least one dimension of at least one feature disposed on the one or more hydrodynamic bearing surfaces.

2. The method of claim 1, wherein the at least one feature includes at least one hydrodynamic groove.

3. The method of claim 2, wherein the at least one hydrodynamic groove comprises sinusoidal hydrodynamic grooves, herringbone hydrodynamic grooves, helix hydrodynamic grooves, and combinations thereof.

4. The method of claim 2, further comprising determining at least one of a width, a depth, and a position of the at least one hydrodynamic groove with respect to the at least one reference plane.

5. The method of claim 1, further comprising determining a ratio of a width of at least one hydrodynamic groove to the distance between the at least one hydrodynamic groove and at least one adjacent hydrodynamic groove.

6. The method of claim 1, wherein establishing the dimensions of at least one feature comprises determining the reference plane from data acquired during the measuring of the surface of the one or more hydrodynamic bearings.

7. The method of claim 6, wherein establishing the dimensions of the at least one feature comprises establishing a distance from the reference plane wherein the distance defines a leading edge or trailing edge of at least one hydrodynamic groove.

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8. A method for analyzing the surface of a hydrodynamic bearing of a disc drive having hydrodynamic grooves, comprising:

rotating the hydrodynamic bearing about a longitudinal axis;

during rotation, measuring the surface topology of the hydrodynamic bearing; and

determining the angular position of the hydrodynamic grooves along the circumference of the hydrodynamic bearing with respect to the longitudinal axis.

9. The method of claim 8, further comprising determining at least one of a depth dimension and a width dimension of the hydrodynamic grooves.

10. The method of claim 8, further comprising determining the ratio of a width dimension of a first hydrodynamic groove to an angular distance between one or more hydrodynamic grooves adjacent the first hydrodynamic groove.

11. The method of claim 8, wherein the hydrodynamic grooves comprise sinusoidal hydrodynamic grooves, herringbone hydrodynamic grooves, helix hydrodynamic grooves, and combinations thereof.

12. The method of claim 8, wherein measuring the surface topology of the hydrodynamic bearing comprises determining at least one edge of the hydrodynamic grooves.

13. The method of claim 12, wherein determining at least one edge of the hydrodynamic grooves comprises establishing a least squares reference plane associated with data derived during measuring, then providing a user defined distance from the least squares reference plane defining the upper boundary of the at least one edge of the hydrodynamic grooves.

14. The method of claim 8, wherein determining the angular position of the hydrodynamic grooves comprises defining a bisector of a measured width distance for the hydrodynamic grooves as a position about midway the measured width distance.

15. The method of claim 14, further comprises determining a depth of the hydrodynamic grooves wherein the depth is defined as the distance from a reference plane to at least two points intersecting the edge of the hydrodynamic grooves about equidistant from the longitudinal axis and about centered about the bisector.

16. A method for measuring the topology of at least one surface of a hydrodynamic bearing disposed about a shaft on a disc drive, comprising:

means for measuring the surface topology; and

means for determining the dimensions of features disposed upon the surface.

17. The method of claim 16, wherein the features include at least one hydrodynamic groove.

18. The method of claim 16, wherein means for measuring the surface topology comprises a rotating means for rotating the hydrodynamic bearing about a longitudinal axis and a surface measuring means for measuring the surface topology.

19. The method of claim 18, surface measuring means comprises an edge-detecting means for analyzing the data to determine at least one edge of at least one hydrodynamic groove disposed on the hydrodynamic bearing.

20. The method of claim 16, wherein means for determining the dimensions of features comprises data processing means for processing data received from measuring the surface topology and an edge-detecting means for analyzing the data

to determine at least one edge of at least one hydrodynamic groove disposed on the hydrodynamic bearing.

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